# SPECTROSCOPIA MOLECULAR

UN PERIODICO DE NOVAS E INFORMATIONES DE INTERESSE E VALOR AL SPECTROSCOPISTAS

Publicate in interlingua per Forrest F. Cleveland, Professor de Physica, Instituto Technologic de Illinois, Chicago 16. Consiliero linguistic, Dr. A. Gode, Division de Interlingua, Science Service, 80 East 11th St., New York 3. 12 numeros per anno, $2.25. Le periodico depende de receptas financiari ab illes qui beneficia de illo.

## SPECTROS DE ABSORPTION ELECTRONIC DE $NH_2$ E $ND_2$

LE SPECTRO de absorption del radical libere $NH_2$ esseva observate pro le prime vice durante le photolyse de scintillation de ammoniaco (Herzberg e Ramsay; 1952) e plus tarde de hydrazina (Ramsay; 1953). Le spectro extende se ab 3900 a 8300 Å e consiste de un grande numero de lineas con separationes irregular. Multes de iste lineas coincide exactemente con lineas observate in le spectro del lumine emittite per un flamma de oxygeno e ammoniaco (Herzberg e Ramsay; 1952), assi establiente le identitate del duo systemas de bandas.

Le bandas de flamma, cognoscite como le bandas $\alpha$ de ammoniaco, ha essite observate in un grande varietate de lampas spectroscopic (vide Ramsay; 1957) e pro multe annos ha essite attribuite al radical libere $NH_2$. Confirmation de iste assignation esseva fornite per le experimentos de absorption e per le observation de displaciamentos isotope quando $N^{14}$ esseva reimplaciate per $N^{15}$ e quando H esseva reimplaciate per D (Herzberg e Ramsay; 1953). Prova final esseva obtenite ex un analyse rotational de alicunes del bandas (Ramsay; 1956, 1957).

In un recente articulo (Trans. Roy. Soc., London A251 (1959) 553-604, No. 1002), K. Dressler e D. A. Ramsay (Consilio National de Recerca, Ottawa 2, Canada) presenta detalios in re le analyse rotational e vibrational de $NH_2$ e $ND_2$. Le spectro se origina ex un transition electronic ab le stato normal in le qual le molecula es nonlinear e es un rotor grandemente asymmetric a un stato excitate in le qual le configuration de equilibrio es linear. Isto es le prime exemplo de un analyse detaliate pro un transition de iste typo.

Le stato excitate monstra un patrono complexe (previemente non observate) de nivellos de energia "vibronic" e rotational. Le structura "vibronic" de iste patrono, insimul con le polarisation e le energia electronic del transition, pote esser comprendite (Dressler e Ramsay; 1957) si il es assumite que le duo statos combinante es derivate ab un stato $^2\Pi$ hypothe-

### Gemma de Sagessa

SI TOSTO que un homine deveni convincite que ille ha mulle valor o que ille non pote in omne caso complir alique, tunc ille es vincite. Sed lassa le creder que ille es appreciate o respectate e ille non pote esser stoppate.

-- RAYMOND E. BALCOMB,
Christian Advocate,
22 septembre 1955.

tic. Es assumite que le nivellos "vibronic" de iste stato $\Pi$ se finde in duo gruppos que se correlata respectivemente con le nivellos "vibronic" observate in le stato excitate e con le nivellos vibrational e rotational del stato normal (stato del terra). Le grande separationes del componentes se origina ex un interaction inter le motiones electronic e vibrational del typo predicite per Herzberg e Teller (1933) e discutite in detalio per Renner (1934). Nonobstante, le finder es multo plus grande que illos considerate per Renner e ha essite explicate quantitativemente in un recente articulo theoric per Pople e Longuet-Higgins (1958).

Le articulo de Dressler e Ramsay es bellemente imprimite super grande paginas (25 x 30 cm), e contine quatro reproductiones excellente del spectrogrammas, nove diagrammas, e 15 tabulas de datos. ♁

## NOVE ADRESSE PRO MEMBROS PROSPECTIVE DEL SOCIETATE OPTIC AMERICAN

SCIENTISTAS QUI desira devenir membros del Societate Optic American e assi reciper le J. Opt. Soc. Am. e Optics and Spectroscopy (le traduction anglese del jornal russe, Optika i Spektroskopiya) debe adressar lor requestas a Dr. Mary E. Warga, Executive Office, Optical Society of America, 1155 16th St., N.W., Washington 6, D.C., S.U.A. (Le adresse date in Spec. Mol. 9 (1960) 5 nunc es obsolete.) Le quota annue pro nove membros es $13.00.

Optika i Spektroskopiya es un del publicationes del Academia de Scientias del U.R.S.S. e ha essite in existentia depost 1956. Illo contine articulos super le optica, filtros, detectores, grilliages de diffraction, electroluminescentia, radiation thermal, polarisatores infrarubie, e super omne brancas del spectroscopia incluse le radios X, ultravioletto, visibile, infrarubio, e microunda.

Le traduction anglese de iste jornal es publicate con un subvention ab le statounitese Fundation de Scientia National e comenciava con le Vol. 6 de januario 1959. Es expectate que le jornal traducite va apparer intra quatro menses post le publication del original russe. ♁

## CHROMATOGRAPHIA DE GASES

UN SYMPOSIO super le chromatographia de gases va esser tenite le 18 al 20 de april al Collegio Canisius a Buffalo in New York.

Le conferentias e le sessiones laboratorial essera in carga de specialistas ab le companias E. I. du Pont de Nemours, Hooker Chemical, Linde, Perkin-Elmer, Burrell-Hypren, Fisher Scientific, Barber-Colman, Beckman Instruments, e alteres. Multes del plus nove equipamentos chromatographic essera disponibile in le laboratorio.

Un del tres dies essera dedicate al presentation de discursos invitate.

Pro altere informationes, scribe a Dr. Herman A. Szymanski, Collegio Canisius, 2001 Main St., Buffalo 8, New York, S. U. A. ♁

## SPECTROSCOPIA DE ABSORPTION ATOMIC

AL ASSEMBLEA del Section Chicago del Societate pro le Spectroscopia Applicate le 9 de februario, Dr. R. A. Sawyer del Corporation Perkin-Elmer parlava super le spectroscopia de absorption atomic.

Dr. Sawyer explicava le uso de iste typo de spectroscopia in le analyse chimic de elementos con un spectrometro infrarubie modello 13 modificate como le unitate pro le absorption atomic. Dr. Sawyer es Secretario-Tresorero del Societate Coblentz. ♁

## PHOTOLUMINESCENTIA DE MOLECULAS ORGANIC

E. D. LIM del Universitate Loyola parlava super le photoluminescentia de moleculas organic le 12 de januario a un assemblea del Section Chicago del Societate pro le Spectroscopia Applicate.

Discutite esseva le presente saper del mechanismo del photoluminescentia de moleculas organic in materias rigide secundo le theoria Lewis-Jablonski, e le resultatos experimental del parlator. ô

-o-

HYDROGENO de grande puritate nunc pote esser producite a parve costo per le dissociation de ammoniaco. Le impuritates es si micre que illos non pote esser detegite per alicun cognoscite methodos analytic.

Informationes in re iste methodo pote esser obtenite ab le Depto. de Reclamos, Industrias Engelhard, 113 Astor St., Newark, N. J., S. U. A. ô

-o-

ETIAM disponibile ab le Industrias Engelhard es un nove brochure intitulate "Noble Metal Thermocouple Wire" (Filos de Metallos Nobile pro Thermocopulas). Isto provide datos in re multe thermoelementos fabricate ex metallos nobile. ô

-o-

LE PRESSA PERGAMON ha establite un bureau in Washington, D. C. a 1404 New York Avenue, N. W. Iste compania publica plus que 50 jornales international de recerca scientific e durante 1960 va publicar proxime a 200 libros, symposios, e monographias in le scientia, technologia, e medicina. ô

-o-

ERRORES: Linea 30 de columna 1 de Spec. Mol. 9(1960)4 debe esser: "se o ulle altere lingua", e linea 12 de columna 2 del mesme pagina debe esser: "ca del radios X e γ, le theoria de". ô

-o-

ESSEREA Spec. Mol. de uso in le bibliotheca de vostre institution? ô

## LE MOLECULA $O_2^+$

LE ROLO del interaction de spin con spin in le finder de multipletto del stato $^4\Pi$ del molecula $O_2^+$ ha essite investigate per I. Kovács del Departimento de Physica Atomic del Universitate Technic a Budapest in Hungaria.

Esseva concludite que le deviationes ab le formulas theoric del termino $^4\Pi_u$ es causate per

1) le interaction de spin con spin e
2) le interactiones de spin con le orbitas de duo terminos $^2\Pi$.

Plus detalios es date in Acta Phys. Acad. Sci. Hung. 10 (1959) 255-8. Le articulo es in anglese. ô

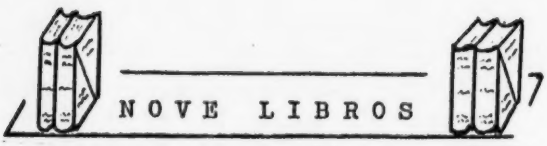
-o-

UN LISTA de articulos publicate durante 1958 per le Centro de Mechanica Undulatori Applicate del Centro National de Recerca Scientific pote esser obtenite ab: R. Daudel, 5 Avenue del Observatorio, Paris 6, Francia. Reimpressiones de iste articulos es disponibile.

Themas tractate in le articulos es le calculation de functiones de unda molecular, le theoria quantic del mechanismo del cancerisation per le substantias chimic, le determination de constantes de fortia ex le functiones de unda electronic, le resolution rapide de systemas de equationes linear, e alteres. Le lista include 20 articulos. ô

-o-

POSITIONES es disponibile a Beckman Instruments, Inc., pro scientistas con grados avantiate pro investigar le conceptos theoric basic de nove instrumentos e pro servir como consultores in le electrochimia o in le spectroscopia ultraviolette o infrarubie. Positiones etiam es disponibile in le physica, chimia, optica, e ingenieria pro labor super instrumentos analytic. Interessatos debe scriber a T. B. Williams, Chef de Placiamento Technic, 2500 Fullerton Road, Fullerton, California, S. U. A. ô



## NOVE LIBROS

• The Fundamental Principles of Quantum Mechanics, with Elementary Applications (Le Principios Fundamental del Mechanica Quantic, con Applicationes Elementari). E. C. KEMBLE. Dover Publications, 180 Varick St., New York 14; 1958. 611 ps. 14 x 21 cm. $2.95. Ligate in papiro.

UN PRESENTATION inductive del mechanica quantic intendite pro le studente avantiate o pro specialistas in altere brancas de physica. Durante que alicun cognoscentia de mathematica avantiate es desirabile, le tractamento es simple, clar, e facilemente sequite. Le applicationes del theoria es contexite con le disveloppamento del structura mathematic basic. Un fundo de materias mathematic es date in Capitulo IV. Le tractamento es rigorose, sed non si rigorose como lo in le libro de von Neumann. Il ha un emphase consistente super le puncto de vista operational e super le importantia fundamental de assemblages Gibbsian de systemas independente in le interpretationes physic del formalismo mathematic.

---

• Vacuum Ultraviolet Emission Lines, Below 2000 Angstroms (Lineas de Emission Ultraviolette Infra 2000 Ångströms). R. L. KELLY. Office of Technical Services, Depto. de Commercio, Washington 25, D. C., S. U. A.; 1959. Reporto UCRL-5612. 520 ps. 21 x 28 cm. $7.00.

CONTINE OMNE le lineas de emission ab 6 a 2000 Å trovate in le litteratura usque a januario 1959. Cata linea de datos da le longitude de unda in vacuo in Å, le elemento, le notation spectroscopic pro le ionisation e intensitate, e numeros de referentia que refere al lista de referentias al fin del reporto. Iste lista include 811 referentias.

Le tabulation es dividite in 4 sectiones:

I. Lineas intense listate secundo le elementos;
II. Le mesme lineas intense listate secundo le longitudes de unda;
III. Un lista complete del lineas secundo le elementos;
IV. Lineas de omne elemento listate secundo le longitudes de unda.

Section III contine 41.000 lineas, section IV 23.000. Potentiales de ionisation es date in sectiones I e III.

Le tabulation es le resultato de labor super le technicas diagnostic pro le studio de plasmas a alte temperaturas. Includite in le tabulas es alicun datos, non previemente publicate, obtenite ab C. C. Kiess e A. G. Shenstone. ô

## REVISTAS

-- Le resonantia magnetic nucleari. R. A. HOFFMAN, Instituto de Physica, Uppsala, Sveda. TVF 30 (1959) 24-9.

---

-- Le practica e application del spectroscopia de resonantia nucleari. R. E. RICHARDS, Univ. Oxford, Anglaterra. Spectrochimica Acta 14 (1959) 5-16. 31 referentias.

---

-- Le radiospectroscopia e problemas del chimia theoric moderne. L. A. BLYUMENFEL'D e V. V. VOEVODSKIĬ. Uspekhi Fiz. Nauk 68 (1959) 31-49. 45 referentias.

---

-- Recerca in le spectroscopia atomic in le U.R.S.S. S. E. FRISH. Ibid. 68 (1959) 3-12. 60 referentias.

---

-- Recente disveloppamento del spectroscopia molecular in le U. R. S. S. B. S. NEPORENT. Ibid. 68(1959)13-29. Coperi le 10 annos passate.

---

-- Methodos pro mesurar le intensitates de lineas Raman. P. A. BAZHULIN e M. M. SUSHCHINSKIĬ. Ibid. 68 (1959) 135-46. 17 referentias.

---

-- Mesuration de intensitates in le spectros infrarubie. V. M. CHULANOVSKIĬ. Ibid. 68 (1959) 147-57. 18 referentias.

---

-- Alicun considerationes theoric in re le intensitates de bandas vibrational. C. A. COULSEN, Univ. Oxford, Anglaterra. Spectrochimica Acta 14 (1959) 161-80. 33 referentias.

---

-- Intensitates de bandas vibrational e factores structural. H. W. THOMPSON, Univ. Oxford. Ibid. 14(1959)145-60. 64 referentias.

---

-- Studios de structuras molecular per le methodo microundic. T. NISHIKAWA, Univ. Tokio. Kagaku no Ryôika 13 (1959) 385-95. 37 referentias.

---

-- Spectros infrarubie e gruppos organic. I - IX. K. NAKANISHI, Univ. Kyôiku, Tokio. Ibid. 13 (1959) 69-74, 146-50, 224-31, 310-14, 379-84, 459-64, 536-42, 607-12, 682-8. Lecturas con referentias.

---

-- Technicas pro mesurar le spectros infrarubie de solidos. M. HORÁK, Chem. československ. akad. věd, Praga. Chemie (Praga) 10 (1958) 710-25. Un revista comprehensive con 114 referentias in re le technicas de discos KBr, incluse un discussion del meritos relative de iste methodo.

---

-- Le spectroscopia Raman. I. Le natura del spectros Raman e lor usos in le chimia organic. K. ULBERT, mesme adresse. Ibid. 10 (1958) 753-65. Un discussion general.

---

-- Motion de puncto zero pro simple moleculas. A. N. HAMBLY, Depto. de Chimia, Collegio Universitari Canberra, Australia. Revs. Pure and Appl. Chem. 9 (1959) 107-16. ô

## MICROFILMES

DISPONIBILE AB University Microfilms, Ann Arbor, Michigan, S. U. A., es le sequente:

* Le perturbation Coriolis e le constantes molecular derivate ex alicun bandas infrarubie pro OCS. G. D. SAKSENA, Univ. Statal Pennsylvania, Parco Universitari, Penna., S. U. A. Mic 59-2912. 59 ps.

---

* Le campos de fortia molecular pro ethyleno, alleno, formaldehydo, keteno, e diazomethano. C. E. BAILEY, Univ. Tenn., Knoxville, Tenn., S.U.A. Mic 59-2683. 205 ps.

---

* Le spectro infrarubie e le structura de un singule crystallo de ethyleno. C. I. BRECHER, Univ. Columbia, New York, Mic 59-2573. 115 ps.

---

* Le spectros vibrational e le configuration geometric de biphenylo. J. E. KATON, Univ. Maryland, Parco Collegial, Md., S.U.A. Mic 59-2532. 106 ps. ô

## ARTICULOS

:- Calculation de intensitates in le spectros Raman de $C_6H_6$, $C_6D_6$, e $C_6H_3D_3$ con le approximationes del ordine zero e un del theoria de valentia optic. M. A. KOVNER e B. N. SNEGIREV, Univ. Statal Saratov. Optika i Spektroskopiya 5 (1958) 239-50.

---

:- Un maser per un resonantia duple nucleari. H. BENOIT, P. GRIVET, L. GUIBÉ, e M. SAUZADE. J. phys. radium 19 (1958) 905-9.

---

:- Preparator electrostatic de specimenes pro le spectroscopia infrarubie de pulveres. H. F. HAZEBROEK, Lab. Koninklijke/Shell, Amsterdam. Spec-

-------- continuate al p.18 ------>

• FEBRUARIO 28-MARTIO 4. Conferentia Pittsburgh super le Chimia Analytic e le Spectroscopia Applicate. Symposio super le fluorescentia e le phosphorescentia molecular. Hotel - Penn-Sheraton, Pittsburgh, Pa. Vide Spec. Mol. 8 (1959) 48. (J. W. Goldzieher, Fundation Sud-West pro le Recerca e le Education, Cassa Postal 2296, San Antonio, Texas, S. U. A.)

• MARTIO 3. Assemblea del Societate Coblentz, 8 P. M., Penn-Sheraton Hotel, Pittsburgh, Pa.

• MARTIO 23-25. Symposio super mesurationes spectroscopic optic a alte temperaturas. Labs. pro le Scientia Applicate, Univ. Chicago. (F. Brech, Labs. pro le Scientia Applicate, Univ. Chicago, 6220 South Drexel Avenue, Chicago 37, Illinois.)

• APRIL 5. Celebration del Centenario del Discoperta del Spectroscopia Applicate per Bunsen e Kirchhoff. Heidelberg. (G. Scheibe, Marsbruckstrasse 186, Dortmund-Atlerbeck, Germania.)

• APRIL 6-8. Gruppo de Spectroscopia Radiofrequentic. Masers e mavars. Nottingham. (D. J. E. Ingram, Univ., Southampton, Anglaterra.)

• APRIL 18-20. Symposio super le chromatographia de gases. Collegio Canisius, Buffalo. (H. A. Szymanski, Collegio Canisius, 2001 Main Street, Buffalo 8, New York.)

• JUNIO 13-17. Symposio annue super le structura molecular e le spectroscopia. Columbus. (Harald H. Nielsen, Depto. de Physica, Univ. Ohio State, Columbus 10, Ohio, S. U. A.)

• JUNIO 20-23. Symposio annue del Section Chicago del Societate pro le Spectroscopia Applicate. Chicago. (J. S. Ziomek, Departimento de Chimia, Universitate De Paul, 1036 Belden Avenue, Chicago 14, Illinois, S.U.A.)

• JULIO 5-15. Curso infrarubie. Univ. Minn. Vide Spec. Mol. 9(1960)7. (B. Crawford, Depto. de Chimia, Univ. Minn., Minneapolis, Minn., S. U. A.)

• AUGUSTO 8-19. Curso infrarubie. Inst. Technol. de Mass. Vide Spec. Mol. 9 (1960) 7. (R. C. Lord, Lab. de Spectroscopia, Instituto Technol. de Mass., Cambridge 39, Mass., S.U.A.) ô

---

. . . ARTICULOS . . . . .

----------→ continuate ab p. 17.

trochimica Acta (1959) 1-5.

---

:- Le spectro de $Li^+$. G. HERZBERG e H. R. MOORE, Consilio National de Recerca, Ottawa 2, Canada. Can. J. Phys. 37(1959)1293-1313. Le displacimentos Lamb in le stato normal e in le prime stato excitate.

---

:- Le stato normal del molecula $C_2$. E. A. BALLIK e D. A. RAMSAY, mesme adresse. J. Chem. Phys. 31(1959)1128.

---

:- Investigation del structura molecular de n-butano per le diffraction electronic. K. KUCHITSU, Depto. de Chimia, Univ. Tokio. Bull. Chem. Soc. Japan 32 (1959) 748-769.

---

:- Cambiamentos in le probabilitates de transition in le spectros de banda diatomic a causa del interaction inter le vibration e le rotation. R. C. M. LEARNER e A. G. GAYDON, Collegio Imperial de Scientia e Technologia, London. Nature 183 (1959) 242-3.

---

:- Le determination experimental de intensitates infrarubie. Proprietates polar ligaminic in $CHF_3$ e $CHCl_3$. J. MORCILLO, J. HERRANZ, e J. F. BIARGE, Instituto de Chimia-Physica, Serrano 119, Madrid. Spectrochimica Acta (1959) 110-21.

---

:- Spectrometro de grilliage de alte resolution pro le infrarubio. E. K. PLYLER e L. R. BLAINE, Bureau National de Standards, Washington, D. C. J. Research, Natl. Bur. Standards 62 (1959) 7-9. Pub. No. 2922. ô

# THE OPTICAL SOCIETY OF AMERICA

*announces its translation of*

## OPTIKA I SPEKTROSCOPIYA

*commencing with January 1959 issue (Vol. 6 No. 1)*

# OPTICS AND SPECTROSCOPY

This leading scientific journal of the USSR Academy of Sciences publishes the work of Russian scientists in all branches of optics and spectroscopy, including x-ray, ultraviolet, visible, infrared and microwave, thin layer optics, filters, detectors, diffraction gratings, electroluminescence, thermal radiation backgrounds, infrared polarizers, and their many other applications in science and industry.

**OPTICS AND SPECTROSCOPY is available FREE to all *members* of The Optical Society of America as part of their membership privileges**

**Membership dues OSA** including both *Optics and Spectroscopy* and *The Journal of the Optical Society of America* **$13.00 per year.** Write Dr. Mary E. Warga, Executive Secretary, Optical Society of America, 1155 Sixteenth Street, N.W., Washington, D.C. for membership application form.

**OPTICS AND SPECTROSCOPY is available FREE to all *subscribers* to the Journal of the Optical Society of America who are *non-members* of the Society**

**Non-member subscription**—package deal of *Optics and Spectroscopy* and *The Journal of the Optical Society of America* **$28.00 per year.** Send non-member subscriptions directly to the AMERICAN INSTITUTE OF PHYSICS, 335 E. 45th Street, New York 17, N.Y.

OPTICAL SOCIETY *of* AMERICA

1155 SIXTEENTH STREET, N.W. WASHINGTON 6, D.C.


V 9 - 95 MAR 60 XUM

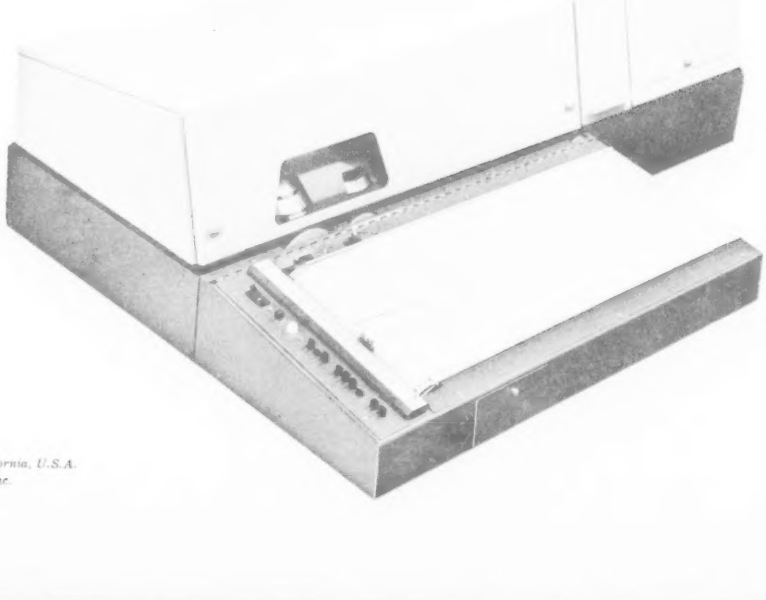
## *This is Ammonia...*

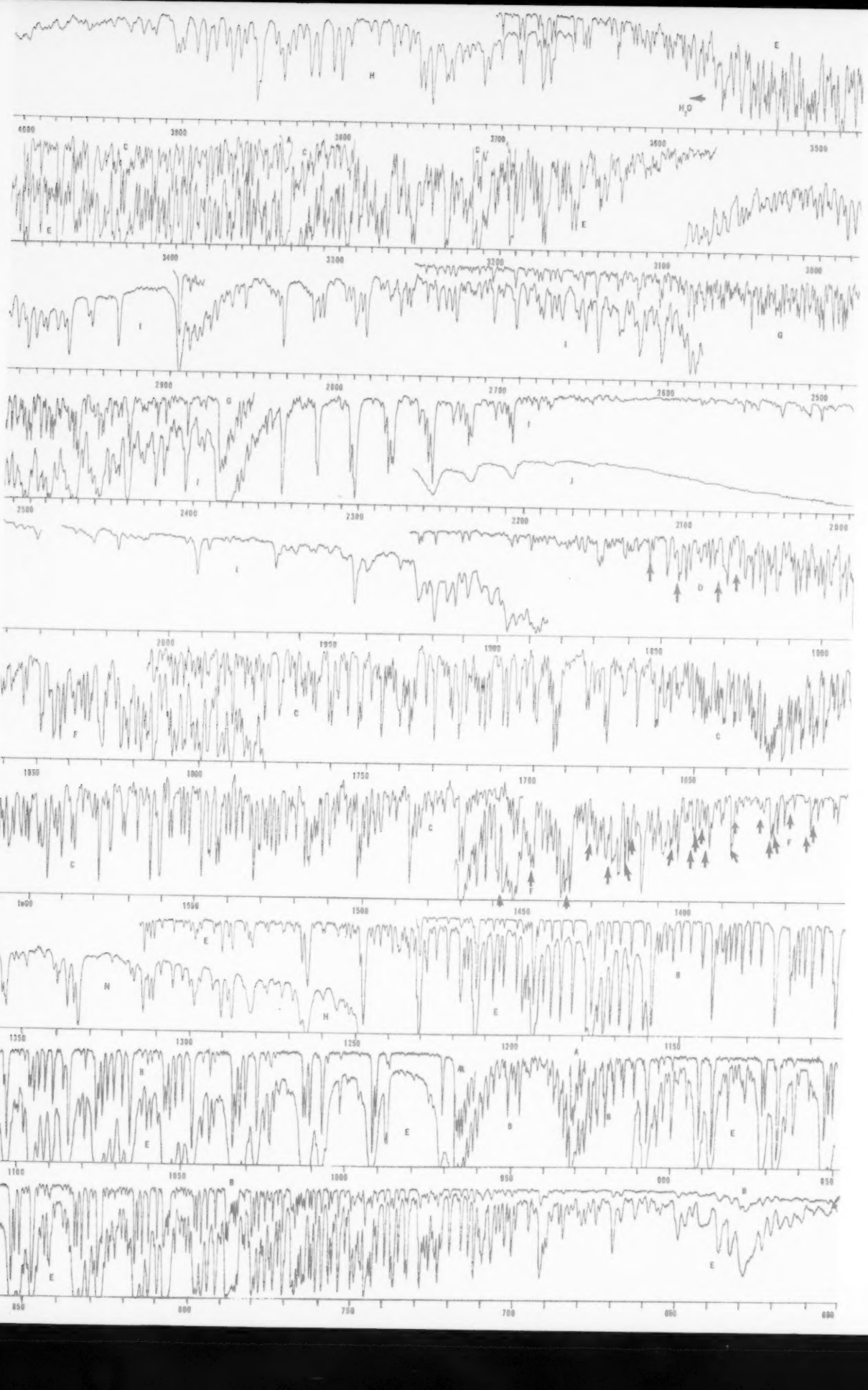
an infrared spectrum never before produced in its entirety—*and automatically*—by a commercially available spectrophotometer. This masterpiece of infrared analysis shows incomparable resolution *throughout* the wide wavenumber range from 600 $cm^{-1}$ to 4000 $cm^{-1}$. The instrument: The Beckman Prism-Grating IR-7 Infrared Spectrophotometer, equipped with a Multi-Path Gas Cell. Want an enlarged reproduction of the ammonia spectrum? And additional information about the automatic continuous scanning IR-7? Write today for Data File L-56-38.

SEE REVERSE SIDE

SAMPLE: 99.5% ammonia...0.5% water vapor
REFERENCE: 10 cm dry nitrogen
SPEED: 0.2 $cm^{-1}$/min...600-2000 $cm^{-1}$
0.4 $cm^{-1}$/min...2000-4000 $cm^{-1}$
GAIN: 30-40%
PERIOD: 32 seconds

| *Spectrum Designation* | *Cell Pressure* | *Cell Path Length* |
|---|---|---|
| A | 7.5 mm | 0.10 M |
| B | 7.5 mm | 1.00 M |
| C | 7.5 mm | 2.8 M |
| D | 7.5 mm | 8.2 M |
| E | 75.0 mm | 2.8 M |
| F | 75.0 mm | 4.6 M |
| G | 75.0 mm | 8.2 M |
| H | 750.0 mm | 2.8 M |
| I | 750.0 mm | 8.2 M |
| J | 110.0 psi | 2.8 M |



**Beckman**®

*International Division*
*2500 Fullerton Road, Fullerton, California, U.S.A.*
*a division of Beckman Instruments, Inc.*